

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PA0256/PCT	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB 03/03179	International filing date (day/month/year) 28.07.2003	Priority date (day/month/year) 30.07.2002
International Patent Classification (IPC) or both national classification and IPC G01N33/487		
Applicant AMERSHAM BIOSCIENCES UK LIMITED et al.		



1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

I	<input checked="" type="checkbox"/>	Basis of the opinion
II	<input type="checkbox"/>	Priority
III	<input type="checkbox"/>	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
IV	<input type="checkbox"/>	Lack of unity of invention
V	<input checked="" type="checkbox"/>	Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
VI	<input type="checkbox"/>	Certain documents cited
VII	<input type="checkbox"/>	Certain defects in the international application
VIII	<input type="checkbox"/>	Certain observations on the international application

Date of submission of the demand 04.02.2004	Date of completion of this report 07.04.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Joyce, D Telephone No. +31 70 340-3093 

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I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-10 as originally filed

Claims, Numbers

1-8 as originally filed

Drawings, Sheets

1/5-5/5 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-8
	No: Claims	
Inventive step (IS)	Yes: Claims	1-8
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-8
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

- D1: US-A-4 128 456 (LEE KAI S ET AL) 5 December 1978 (1978-12-05)
- D2: PATENT ABSTRACTS OF JAPAN vol. 2000, no. 02, 29 February 2000 (2000-02-29) & JP 11 299496 A (HITACHI LTD), 2 November 1999 (1999-11-02) cited in the application
- D3: WO 01 71349 A (NORWOOD JAMES HENRY ;CENES LTD (GB); PIOTROWSKI VOI (GB); OWEN DAV) 27 September 2001 (2001-09-27)

The subject-matter of claims 1-8 is considered to be novel and inventive within the sense of Art. 33 (2) and (3) PCT, for the following reasons:

The document D1 is regarded as being the closest prior art to the subject-matter of independent claims 1 and 7 and discloses (the references in parentheses applying to this document):

-cell holding electrode arrangement comprising a hollow electrode sheath(3) open at a cell contact tip (13), said sheath surrounds at least one elongated electrode needle (cf D1 Col 1 line 65-ol 2 line 15).

Vis-a-vis this known device the system of claim 1 differs in that the elongated electrode needle (7) is provided with a plurality of sensing electrodes, or said sheath (3) surrounds a plurality of elongated electrode needles each provided with at least one sensing electrode, hence the apparatus of claim 1 and the corresponding method claim 7 is novel.

The additional features of a plurality of sensing electrodes, or said sheath (3) surrounding a plurality of elongated electrode needles each provided with at least one sensing electrode address the problem of providing an apparatus for robust cell seeding and multi-orientated solution dipping methods, providing intracellular electrical access.

As the cell passes in proximity to open-end of electrode sheath (3), a conductance change measured between 15a-15n triggers suction. A small vacuum is generated

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thereby sucking the cell onto the open end. The vacuum is strong enough to pull sufficient biomaterial into the sheath allowing easy insertion of the needle. After penetrating the cell, some electrodes remain outside the cell, only 2 electrodes inside at any one time, whereby the risk of piercing the nucleus is minimised.

Such an apparatus and method is not apparent from the consulted or cited prior art, addressing the above mentioned problems, in relation to cellular manipulation and electrophysiological recording techniques.

Concluding, the independent apparatus and method claims 1 and 7 respectively are also seen to involve an inventive step.

Claims 2-6 and 8 define further refinements of the inventive idea underlying claims 1 and 7 respectively. As such these claims also meet the requirements of Article 33 PCT.

As the industrial applicability of the subject-matter of claims 1 and 7 is immediately apparent, all the requirements of Article 33 PCT are thus met.